WHAT IS CLAIMED IS:

1. A stacked photovoltaic element comprising a plurality of unit photovoltaic elements each composed of a pn- or pin-junction, connected to each other in series, wherein a zinc oxide layer is provided at least one position between the unit photovoltaic elements, and the zinc oxide layer has resitivity varying in a thickness direction thereof.

2. The stacked photovoltaic element according to Claim 1, wherein zinc oxide of the zinc oxide layer on a side of being in contact with a p-layer of the pn- or pin-junction has a higher resistivity than that on a side of being in contact with an n-layer of the pn- or pin-junction.

3. The stacked photovoltaic element according to Claim 2, wherein a resistivity of the zinc oxide continuously decreases in the zinc oxide layer from a side of the zinc oxide layer in contact with the p-layer towards a side of the zinc oxide layer in contact with the n-layer.

4. The stacked photovoltaic element according to Claim 1, wherein a resitivity of zinc oxide of the zinc oxide layer is 2×10^{0} Ωcm or more but 5×10^{3} Ωcm or less.

5. The stacked photovoltaic element according to Claim 1, wherein a high resistant portion of zinc oxide of the zinc oxide layer has 5×10^2 Ωcm or more but 5×10^3 Ωcm or less.

6. The stacked photovoltaic element according to Claim 1, wherein at least one of the plurality of the unit photovoltaic elements has a pin-junction comprising an i-type layer composed of amorphous Si:H.

7. The stacked photovoltaic element according to Claim 1, wherein at least one of the plurality of the unit photovoltaic elements has a pin-junction comprising an i-type layer composed of microcrystalline Si.

8. The stacked photovoltaic element according to Claim 1, wherein at least one of the plurality of the unit photovoltaic elements has a pin-junction comprising an i-type layer composed of single-crystalline or poly-crystalline Si.

9. A method for producing a stacked photovoltaic element comprising an intermediate layer between photovoltaic elements each having a pn- or pin-junction, wherein a first layer mainly composed of indium oxide is stacked on at least one interface

with the photovoltaic element and then a second layer mainly composed of zinc oxide is stacked on the first layer to form the intermediate layer.

10. The method according to Claim 9 for producing a stacked photovoltaic element, wherein the second layer is formed to be thicker than the first layer.

11. The method according to Claim 9 for producing a stacked photovoltaic element, wherein the first layer is formed to have a thickness of 1 nm or more but 50 nm or less.

12. The method according to Claim 9 for producing a stacked photovoltaic element, wherein the second layer is formed at a rate higher than that of the first layer.

13. The method according to Claim 9 for producing a stacked photovoltaic element, wherein the second layer is formed at a temperature lower than that of the first layer.

14. A stacked photovoltaic element comprising an intermediate layer between photovoltaic elements each having a pn- or pin-junction, wherein the

intermediate layer comprises a first layer and a second layer stacked in this order on at least one interface with a photovoltaic element, the first layer being mainly composed of indium oxide and the second layer being mainly composed of zinc oxide.

15. The stacked photovoltaic element according to Claim 14, wherein the second layer is thicker than the first layer.

16. The stacked photovoltaic element according to Claim 14, wherein the first layer has a thickness of 1 nm or more but 50 nm or less.

17. The stacked photovoltaic element according to Claim 14, wherein the second layer has a higher transmittance than the first layer at a wavelength of 800 nm.